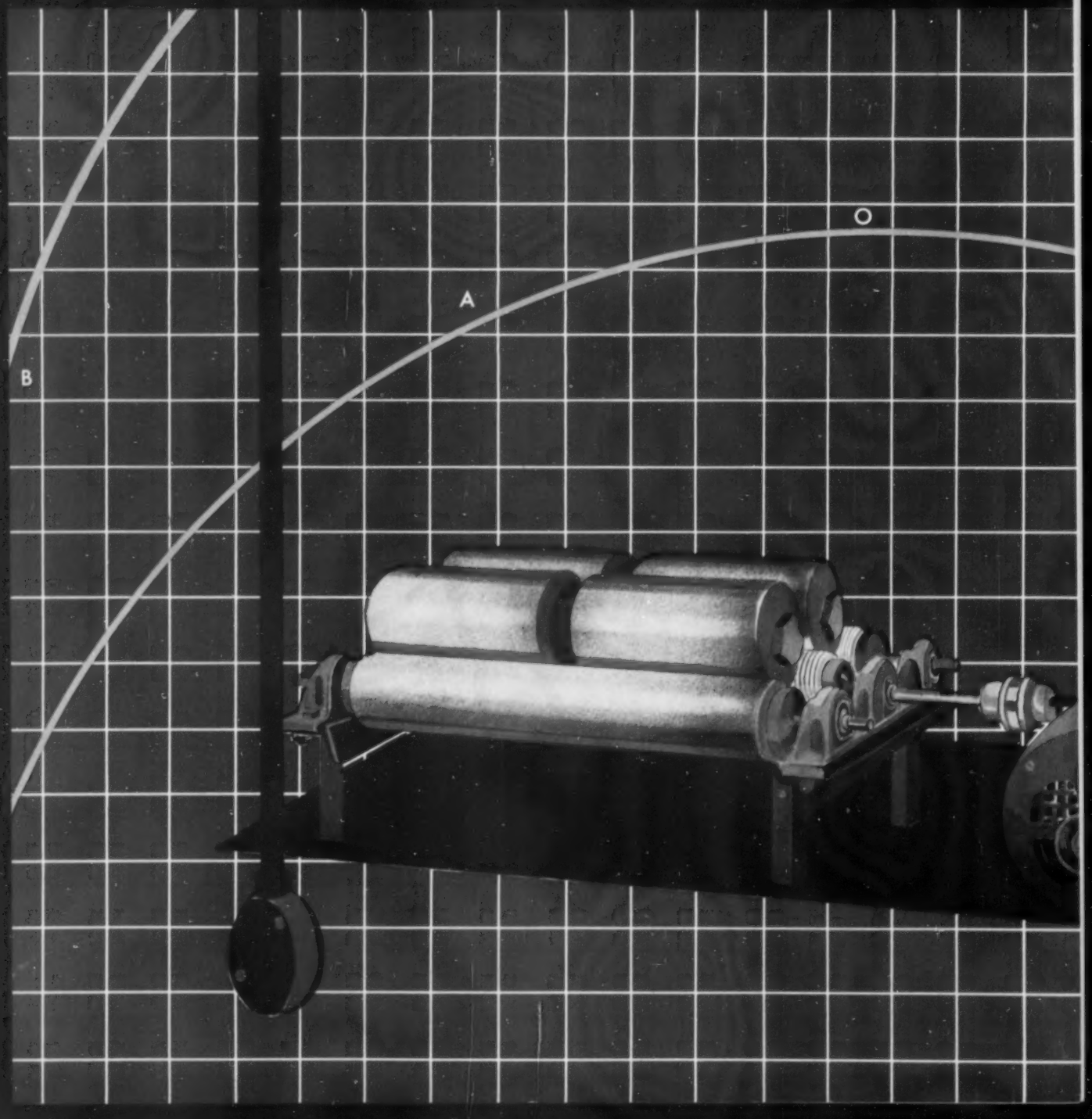
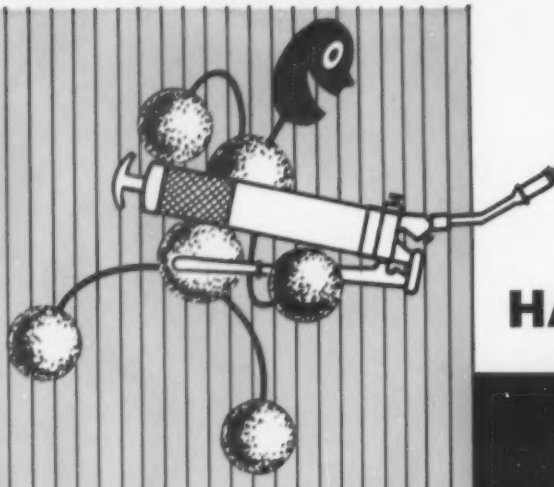
NLGI Spokesman

Journal of National Lubricating Grease Institute





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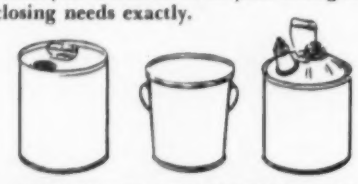

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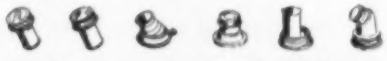

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President's page

by W. M. MURRAY, President, N L G I

It is a privilege and a pleasure to address you in print for my first official message.

The 23rd Annual Meeting has been recorded. It was a good meeting and to me was well organized, well planned and beautifully executed. The general theme and the individual topics were of interest. Attendance records were broken and comments, in the main, were complimentary. The real proof of success, however, takes time in development.

The meeting received appreciated publicity in both trade and newspapers. An editorial suggests that petroleum industry management look a bit more keenly at this important part of the oil business.

Why?

Because of an impression made that the hard working essential lubricating grease group, lacking in glamour, is not properly credited for its major contributions to sound lubrication practices. If that is even a single impression, let's change it promptly. In this changing world of shifting patterns, rapid communications and other means are available to us for use in engaging the attention of related industries to the merits of our plans and products. We're of tremendous direct importance to many industries, all of whom should know the objectives of the Institute to maintain free and open competition while serving industry.

In closing, please accept my thanks for having honored me. When you are in Kansas City, visit headquarters. As often as I may, I'll be there, too. Let's enjoy that Key to the City given to me by His Honor Mayor Bartle.

Published monthly by
National Lubricating Grease Institute
Harry F. Bennetts, *Editor*
Joan Swarthout, *Assistant Editor*
4638 J. C. Nichols Parkway
Kansas City 12, Mo.

1 Year Subscription $2.50
1 Year Subscription (Foreign) . .$3.25

NLGI Spokesman

Vol. XIX NOVEMBER, 1955 No. 8

IN THIS ISSUE

ABOUT THE COVER

When this cover illustration was created your editor was deep in annual meeting plans. Everything this month was left to artist Ronald Jones and Assistant Editor, Miss Joan Swarthout.

Analyzing the technical article, they came up with a drawing of the Shell Roll Tester. For background they chose a graph illustrating one result. The whole picture is an idealized version of the equipment used by the excellent technicians who create and continuously test the versatile products produced every day by this industry.

The Design and Use of the

SHELL ROLL TEST

By J. D. SMITH

International Lubricant Corporation

As presented at the ASTM Symposium, Technical Committee G, Houston, Texas, February 16, 1955. This was part of the first section, "Evaluation of Laboratory Equipment."

The early history of this test dates from the late 1930's when H. M. Fraser procured through Shell Oil Company, New York, a copy of a design for such a tester originating with Shell-Amsterdam. A unit was then constructed similar to this design but, due to the inconvenience of operation caused by having to dismount the test cylinder from between two bearings each time an observation was to be made, it was abandoned after a few runs in favor of a modified design, shown in Fig. No. 1.

In this design the supporting frame and bearings are made substantial enough to overhang the test cylinder so that the free end may be opened and closed at will, thus allowing ease of operation and frequent inspections. Several units of this design were constructed during the next few years and are still in operation.

Basically, the test is a simple one—a cylinder with both ends closed is rotated with a free riding, heavy, solid roller of smaller diameter on the inside together with the grease sample under test. Rolling is done at a speed sufficient to cause the inner roller to turn on its own axis as well as to attempt to climb the wall of the cylinder. The net result is a severe shearing of the grease sample that involves perhaps three types of motions—which for lack of better terms may be called squeezing, sliding, and kneading. The following table contains basic data for the test unit and original test conditions:

Cylinder, length inside, mm	180
Cylinder, inside diameter, mm	90
Cylinder, wall thickness, mm	12.5
Roller, length, mm	176
Roller, diameter, mm	60
Roller, weight, kg	5
Speed of test cylinder, rpm	160
Grease charge, grams	90
Ambient temperature, degrees F	77

Originally, the idea was to roll the sample for an arbitrary time and then observe its consistency and structure changes. However, a wider application suggested itself: If the apparatus could be easily disassembled and a quantitative means used to measure grease consistency on a small sample, then a series of tests could be run on the same sample and a consistency-time breakdown curve plotted. From this curve one could determine not only the over-all life but could study the pattern and rate of breakdown. Originally several micro penetrometers or micro cones using the standard ASTM penetrometer were used for these consistency measurements. However, in the early 1940's a cone for use with the ASTM penetrometer was procured from Shell Oil Company's Wood River Refinery, that has been used to the present time.

This cone, along with a description of its use in their study of the Shell Roll Test, was described by R. P. McFarlane.[1] With this cone and using a standard commercially available tinned cup, micro penetrations can be obtained on approximately 85 grams of grease. Correlation with ASTM Standard Cone penetrations were shown, indicating relatively small deviations on different types of greases, Fig. 2. Since that time, it has been found that for

1. R. P. McFarlane, "Shell Rolling Stability Apparatus and Shell Micro Penetrometer," *NLGI Spokesman*, March, 1943.

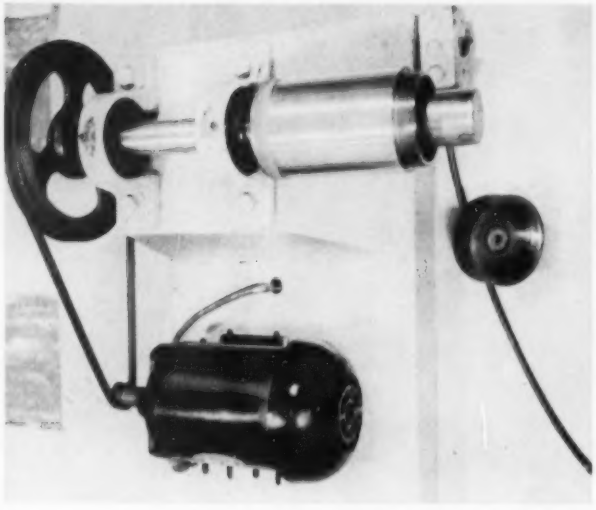


Figure 1. ". . . the supporting frame and bearings are made substantial enough to overhang the test cylinder"

best correlation a separate curve is desirable for each type of grease being studied.

However, ASTM Committee G is currently investigating a quarter scale cone which promises to eliminate this variable, and when this has been standardized, direct correlation on micropenetrations may be obtained.

This type of tester was used for both control and research work until 1946. At this time it was decided to change the design of the driving mechanism and to install the entire assembly in a 77° F. air conditioned room to avoid seasonal variations in test temperatures.

The basic design change involved separating the test cylinder completely from the driving mechanism and allowing it to roll free on a pair of separate rollers. Fig. 3. The advantages of this design are obvious:

1. Several test cylinders can be driven by one motor and on one frame, thus providing a saving in space and cost per unit test.
2. Individual tests may be removed and checked without disturbing the others.

These advantages are particularly suitable for checking greases of extreme shear stability which may run several hundred hours instead of the usual five minutes to ten hours that many of the less stable conventional greases run before liquefying. The design is simple and flexible, while the cost is nominal.

In connection with this high temperature roll stability, several units have been constructed with variable speed drives so that the conditions specified by Rock Island Arsenal for MIL-G-10924, Amend. 2 grease may be met. Thus, from the normal 220° F. and 160 RPM the unit may be adjusted to 150° F. and 10 RPM.

The procedure for the longer life greases with this apparatus requires no skilled technicians and is not time consuming. Normally, a micropenetration of the original grease sample is taken first. Then, at intervals, such as 2, 4, 8, and 24 hours, followed by once a day for the life of the grease, the cylinder is pulled from the driving rollers, opened, the grease removed, temperature adjusted

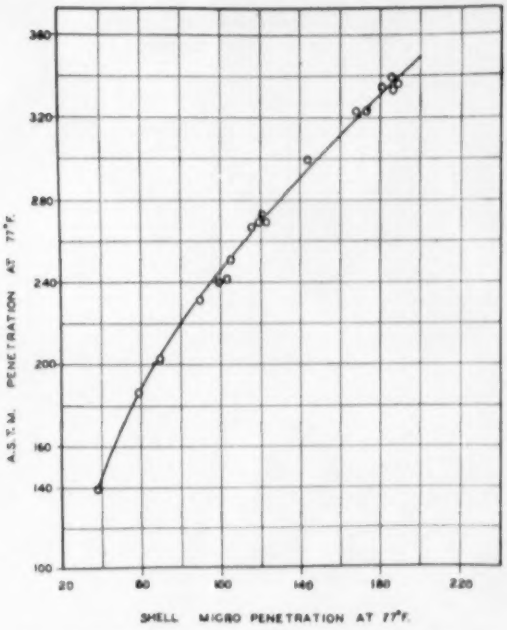
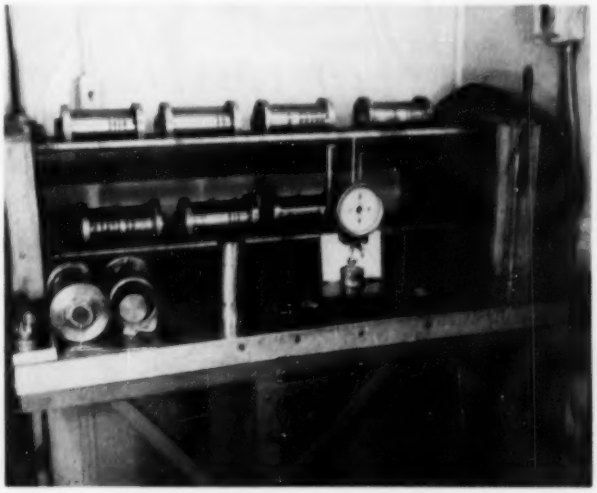


Figure 2. "Correlation with ASTM Standard Cone"

to 77° F., micropenetration taken, and the test resumed on the same sample. Thus, a sufficient number of points are obtained to plot a valid breakdown curve regardless of what particular cone or penetrometer may be used for the consistency measurement. Typical curves are shown in Fig. 4.

Following the design and use of the multiple roll test apparatus at room temperature, the next logical step in the specialized application of this tester was to enclose it in an insulated, thermostatically-controlled cabinet so that it could be used to study shear stability at above room temperatures. Fig. 5. Most of International's work has been done at 220° F., which corresponds to the ASTM Wheel Bearing Test temperature. It follows that

Figure 3. ". . . separating the test cylinder completely from the driving mechanism"



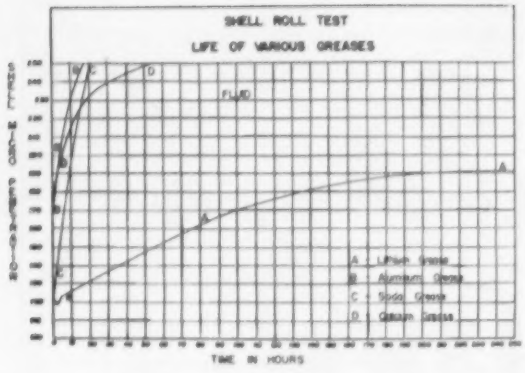


Figure 4. "A sufficient number of points are obtained to plot a valid breakdown curve"

observations and consistency measurements can be made at both the test temperature and after cooling to room temperature. Both procedures have been used; however, normally the sample is rolled for a given time and then brought to room temperature for consistency measurement. This type of data has proved very valuable in the development and control of greases with high temperature shear stability.

After almost twenty years continuous use of this test in its various modifications, it is our opinion that, in the development and control of quality greases, it has been

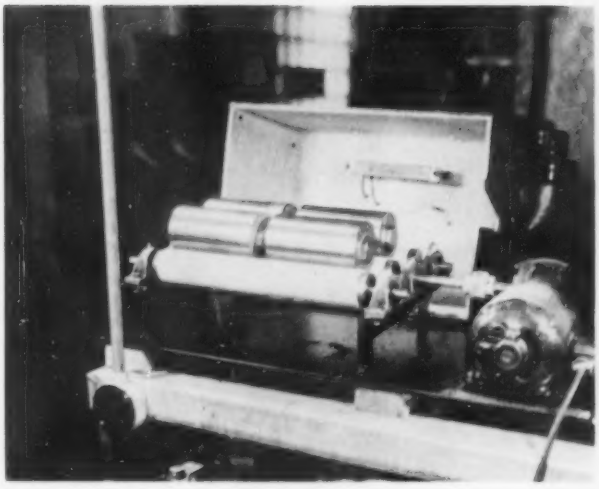


Figure 5. ". . . the next step was to enclose it in an insulated thermostatically-controlled cabinet"

and still is an invaluable aid. It is basic reasoning that, if a given bearing requires an optimum consistency grease for best performance, then a grease should be selected that will resist breaking down in the bearing to a much softer product. The Shell Roll Test apparatus has been shown to yield data which may be used to predict such a tendency to break down in service.

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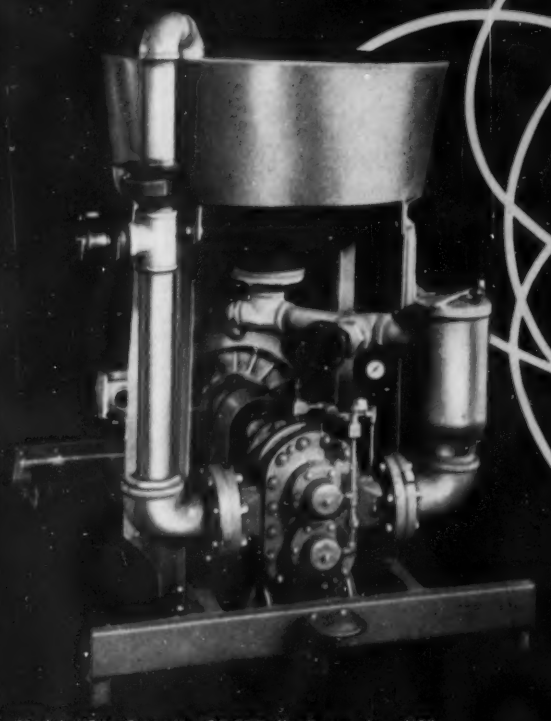

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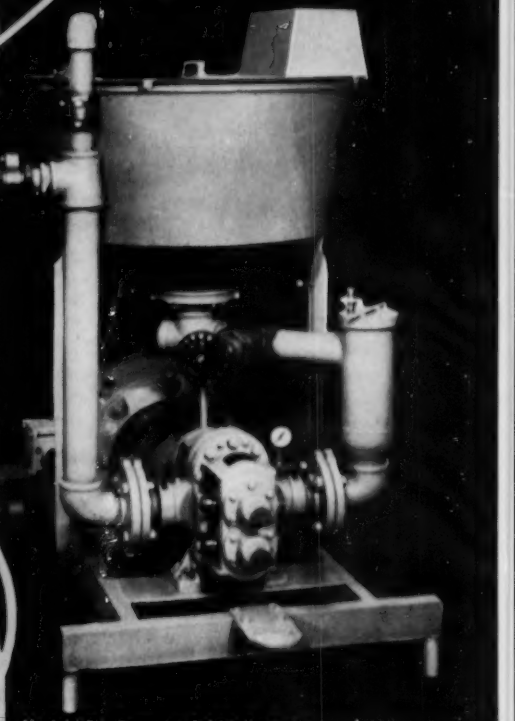

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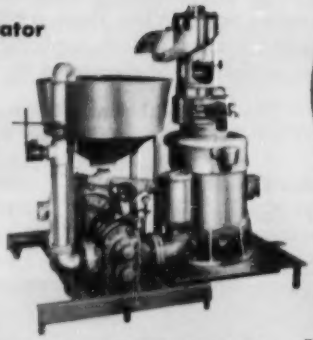

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Grease Shear Stability

By CHARLES A. BAILEY

National Tube Division,
United States Steel Corporation

As presented at the ASTM Symposium, Technical Committee G, Houston, Texas, February 16, 1955. This was part of the first section, "Evaluation of Laboratory Equipment."

ABSTRACT

The American Society for Testing Materials Manual contains test methods for greases such as D-217, Penetration; D-217A, Grease Shear Stability; D-566, Dropping Point; D-942, Grease Oxidation; D-1264, Water Washout; and others.

Because the number of grease testing procedures in the ASTM Manual is rather limited, other tests have been developed to more completely describe the performance of lubricating greases. The important properties required for operating conditions are simulated in the following tests: Timken Lubricant (in committee), 4-Ball E.P. Apparatus, 4-Ball Wear Apparatus, Water Leaching Test, Water Absorption Test, Oil Separation, Roller Test, Grease Pumpability, Grease Beater Test, etc.

As a consumer of petroleum products we prefer to use ASTM test methods if they are available, but when operating conditions demand, it is necessary to develop a test simulating the conditions encountered in the field. It is this increased interest in the change in grease structure in operations that has stimulated the design of grease shear stability tests.

In discussing these tests, it is not our intention to tell the supplier how to make grease. The problem is strictly the grease maker's business. Any test should be functional and should convey to the user and supplier the important physical conditions encountered in the operation.

There are two shear stability tests used at our laboratory and one leakage evaluation test, described as follows:

1. The Motormatic Grease Worker
2. The Roller Test
3. The Wheel Bearing Test

The action of the roller test simulates more closely the action of a roller bearing and appears to be more severe than the Motormatic Worker. Comparative test data has established the variation of severity in four general classes as follows:

Rating of Shear Stability
Motormatic Versus Roller Test

% Change Increase or Decrease Motormatic	*% Change Increase or Decrease Roller Test*	*Wheel Bearing Leakage Loss, % 235F*	*Rating*
0-5	0-10	0-1	Excellent
5-15	10-25	1-5	Good
15-30	25-60	5-10	Fair
30 or over	60 or over	10 or over	Poor

It would appear from this comparison that a product with a zero change in consistency or an excellent shear stability rating would be an ideal lubricant. However, there is evidence that products with outstanding shear stability properties may be deficient in one or more other service requirements, which may or may not be correlated with shear stability.

The present evaluation of shear stability is the per cent change in consistency using ASTM or Microcone Penetration tests. While these methods of consistency measurement are excellent, applying percentages to them may be misleading as illustrated by the following tabulation:

Consistency Change Evaluation
Penetration Change Versus Percentage

Base Soap	*Penetration Before*	*Penetration After*	*Penetration Change in MM*	*% Loss*
1. Calcium	360	389	29	8.05%
	117	145	28	23.9%
2. Lithium	307	339	32	10.4%
	140	170	30	21.44%
3. Soda	304	318	14	4.16%
	146	158	12	8.22%
4. Calcium	310	316	16	5.16%
	151	167	16	10.60%
5. Lithium	309	345	36	11.65%
	161	199	38	23.60%
6. Calcium	300	360	60	20.00%
	134	180	46	34.32%

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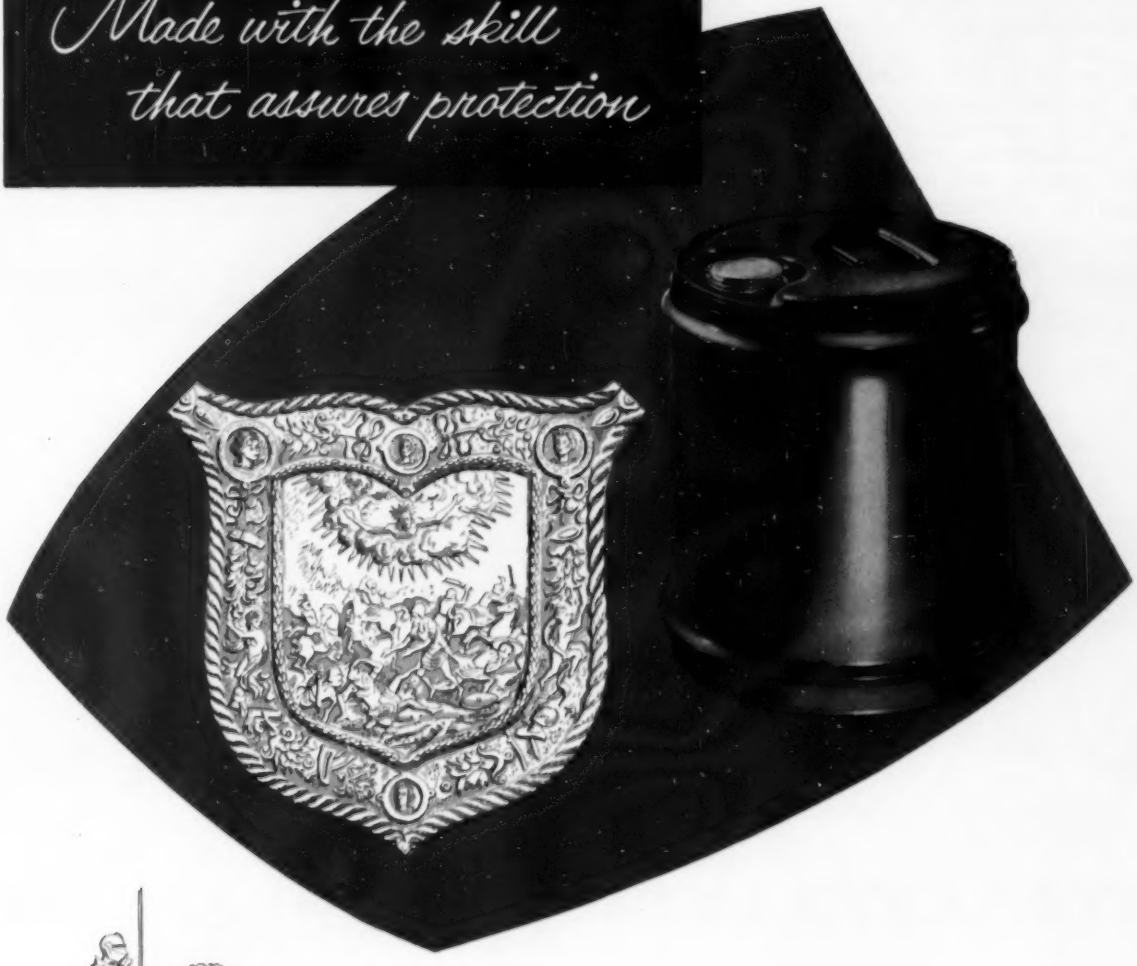

This superbly carved and inlaid shield is a product of skillful 16th Century armor-making. Its dimensions and balance permit easy handling. The intricate carving and embossment reveal it as a materpiece of sculpture. And most important of all, the sturdy construction and careful design gave maximum protection to the warrior who carried it in battle.

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It is quite evident that any one test will never completely evaluate greases thereby predicting field experience. The shear stability tests appear to be good laboratory methods simulating field conditions, with the degree of shear stability being an important consideration. Obviously, greases having a measureable consistency would not be considered acceptable if they can be poured from the container after working in a worker or roller. There is some indication that greases with extremely high shear stability, showing little or no change before and after working, may be deficient in other properties.

There are important properties that may or may not be related to shear stability. These properties either do not have any laboratory test method or the present methods are lacking in interpretation.

Conclusions

In conclusion, the Motormatic and roller tests are excellent functional evaluation methods for shear stability, simulating field performance as closely as possible. However, the data reported should be in terms of penetration units for a given NLGI grade rather than percentage. The importance of not sacrificing other important properties to obtain the ultimate in shear stability cannot be over-emphasized. Therefore, these presently intangible properties with inadequate test methods should be explored in connection with shear stability.

Shear Stability of Greases

By E. L. ARMSTRONG
and R. A. BUTCOSK
Socony Mobil Laboratories

The following paper was presented during the first section of the ASTM Symposium, Technical Committee G, February 16, 1955, under the subject "Evaluation of Laboratory Equipment."

ABSTRACT

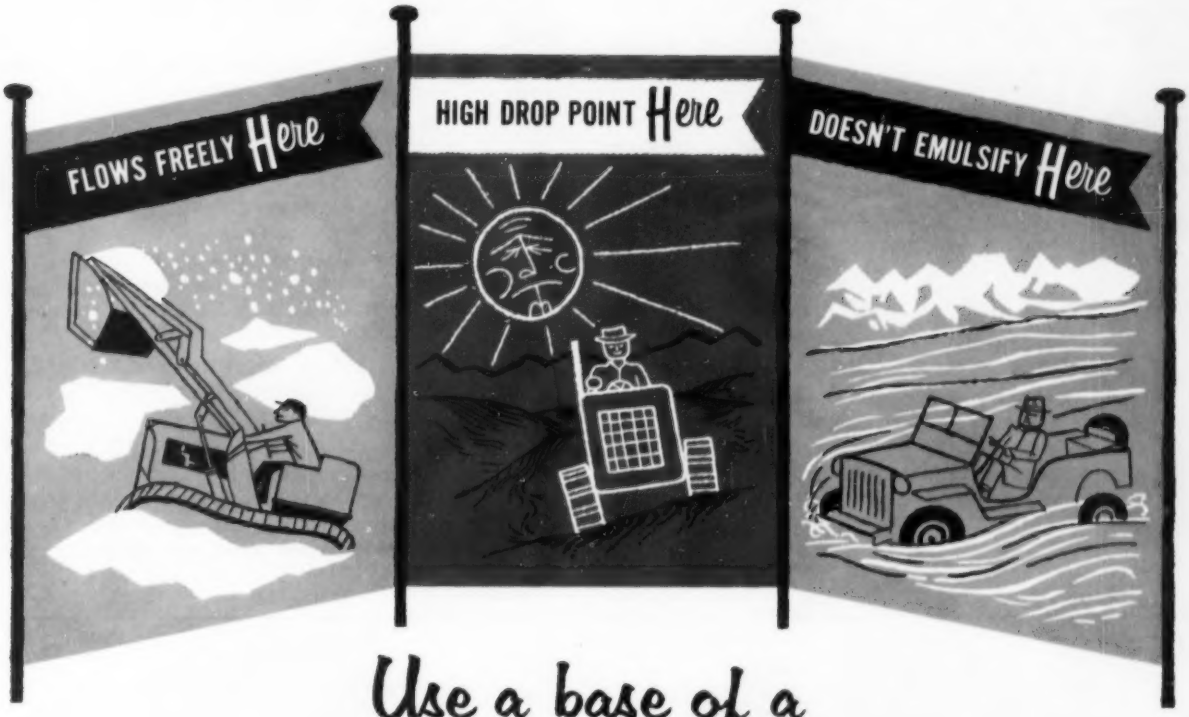
The Roll Stability Test is a faster method than the ASTM Motormatic Worker Test and has been used for production control on several greases for the past five years. Test limits vary, based on correlations with field performance properties.

In testing greases, poor correlation often results between the laboratory shear stability data and service performance since:

1. laboratory testers operate at a fixed, relatively low shear rate compared to the wide range of shear existent in a bearing
2. laboratory test temperatures do not duplicate field service temperatures
3. contaminants such as water, other greases, etc. may have a pronounced effect on shear softening of greases.

With any given grease, it is necessary to accumulate both laboratory and field service data before the Roll Stability Test can be used successfully as a quality control tool in manufacturing operations.

For greases you can send anywhere —make economically, too



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Also, the Metasap technical staff is notably successful in suppyling makers of greases with the exact properties they need for each specific task. There's a Metasap base which gives you a high gel type grease when *that's* what you need; another for a medium heavy gel where smoothness is your chief requisite; still another which produces the semi-fluid, adhesive-type lubricant known as castor machine oil.

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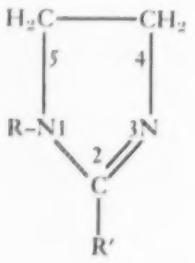
Patents and Developments

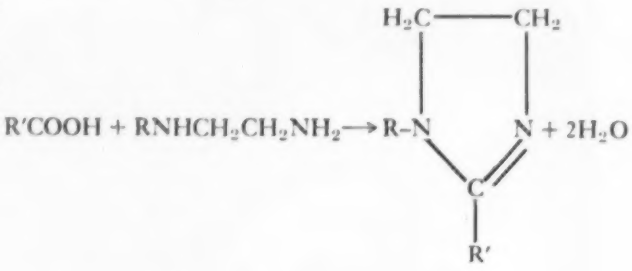
Inorganic-Gel Thickened Greases

Patents, such as U. S. Patent 2,260,625, have disclosed the use of aerogels for thickening lubricating greases, but it has been found out since that silica-gels are not, by themselves, satisfactory in presence of moisture, and a number of patents have already been discussed in this section wherein the gel is first treated with amines, surface-active agents, and similar compounds to improve water resistance.

In U. S. Patent, 2,711,393, Standard Oil Company (Ohio) discloses a gel-thickened grease in which the gel is treated with a surface active, oil-dispersible, water-insoluble alkyl alkylol imidazoline of the general structure: where R is an alkylol group and R′ is an alkyl or alkylene group.



These compounds are prepared by reaction of aliphatic acids and hydroxy diamines followed by cyclization, in the following way:



Hydroxy diamines in which R is of from 1 to about 6 carbon atoms, such as hydroxyethyl and hydroxyisopropyl, are readily available and are preferred. The chain length for R is dependent upon the alcoholic (polar)

character of the group; the larger the number of carbon atoms, the more the group takes on the character of a hydrocarbon and loses its alcoholic character. An upper limit of about 18 carbon atoms for R is indicated by this requirement. *R', which is derived* from an acid, can have from 11 *to* 21 *carbon atoms*, such as undecyl, tridecyl, pentadecyl, undecenyl, heptadecyl and heptadecenyl. The thickened lubricant so prepared has excellent temperature susceptibility properties which are characteristic of the silica aerogel greases, and in addition is highly resistant to deterioration by water.

The presence of the alkyl alkylol imidazoline also does not markedly affect the consistency of the thickened lubricant, i.e., the amount of the inorganic gelling agent to impart a given consistency to the thickened lubricant is not materially modified. Furthermore, the inclusion of the alkyl alkylol imidazoline will not effect a change in the consistency of the thickened lubricant upon storage. This is to be contrasted with other materials which impart a lower initial consistency or a lower consistency on standing.

Due to the inorganic nature of the gelling agent, the thickened lubricant has excellent storage stability. This is to be contrasted with the heat susceptibility and deterioration of fatty materials in soap.

The silica gels suitable for this purpose are discussed in length in the patent as follows:

The inorganic gelling agent to be used in making the thickened lubricant in accordance with this patent may be any inorganic material which forms a gel with a lubricating oil and which is so finely divided as to be nonabrasive. The preferred materials are the aerogels, which may be formed from any material not incompatible with oil, such as silica, alumina, and other gel-forming metal oxides.

A series of silica gels which can be used as the inorganic gelling agent of the invention are manufactured by Monsanto and marketed under the trade name "Santocel."

Santocel C is prepared from a sodium silicate solution in the following way: The solution is neutralized with sulfuric acid and then allowed to stand until the mixture sets to form a hydrogel. The by-product sodium sulfate is washed out by the repeated washings with water. The continuous water phase in this hydrogel is then replaced by continued washing with alcohol until an alcogel is formed. In order to remove the liquid phase without a collapse of the gel structure, the alcogel is placed in an autoclave which is then heated above the critical temperature of the alcohol and the pressure is allowed to increase to a point above the critical pressure of the alcohol. The vent valve is then opened and the alcohol allowed to escape. Under these conditions, the silica gel structure remains practically undisturbed and the liquid phase of the gel is replaced with air. The material is then reduced in

particle size by blowing it through a series of pipes containing sharp bends with jets of compressed air. Santocel C has a secondary particle size of about 3 to 5 microns.

Santocel A is prepared as set forth for Santocel C up to the point of removal of the product from the autoclave. This material is run through a continuous heating chamber where it is heated for ½ hour to a temperature of about 1500° F. to eliminate the last traces of volatile material. It is then broken down in a reductionizer or micronizer to a particle size of about 1/16 inch in diameter. The solids content of the original hydrogel used in preparing Santocel C is approximately 25% higher than that of Santocel A.

AR is a modification of A, differing only in that the material is reductionized to about the same particle size as C, approximately 3 to 5 microns in diameter.

ARD is a modification of AR, differing only in that ARD is densified by extracting air under vacuum, and therefore has a smaller volume than AR.

AX is an A which has not been devolatilized.

CDv is a C which has been devolatilized as set forth for Antocel A. The Santocel is reductionized before being devolatilized.

CDvR differs slightly from CDv in that the CDvR has been devolatilized just after heating in the autoclave and then reductionized. It differs from CDv in that the latter is reductionized before being devolatilized.

The primary differences between the A and C series are as follows:

1. The C's are prepared from a sodium silicate solution containing 25% more silica than the A's. Therefore, in general the A's are lighter and composed of smaller particles than the C's.

2. The A's have undergone a devolatilization step in their preparation.

The following are the bulk densities of several of the preferred silica aerogels:

	Density, grams per ml.
AR	0.029
ARD	0.056 to 0.064
C	0.082

In general, AR and ARD show superior gelling ability and the A's in general are better than the C's. Silica aerogels which have been devolatilized generally have a higher gelling efficiency than the undevolatilized aerogels.

Other types of inorganic gelling agents which may be used include a Fumed Silica marketed by B. F. Goodrich Company. It is finely divided and appears very much like an aerogel. It is made by a combustion or vaporization process, as a source of white "carbon black" for the rub-

ber industry. The particles are several microns in size and porous in nature.

Another material is "Linde Silica Flour" marketed by Linde Air Products Co. It is very similar in physical appearance to the silica aerogel. The particle size of the silica is purported to be 0.01 to 0.05 micron and to be manufactured by burning silicon tetrachloride and collecting the combustion product on cool plates analogous to the production of carbon black. The particles are thought to be aggregates or clusters of particles rather than of sponge-like character.

Still another inorganic gelling agent known is "Ludox" silica from Du Pont, which is known as a silica sol and silica derivatives thereof. It has a particle size of the order of 0.01 to 0.03 micron.

In preparing thickened lubricants it is necessary to remove the water from the sol and replace it with an oil. This is possible by formulating the lubricant and removing the water by flash distillation or azeotropic distillation.

In general, the concentration of the imidazoline will vary from 0.1% to 5%, depending on the water stabilizing effect desired, etc. Usually, the imidazoline is uniformly distributed in the oil and the inorganic gelling agent is added to the mixture. Good results were obtained with Amine "O," 1-beta hydroxy ethyl 2-heptadecenyl imidazoline.

In U. S. Patent 2,711,394, the same company points out that silicas from Columbia-Southern also are useful for this purpose, and properties of these gelling agents are given. In this patent, greases containing 2.5-35% powdered graphite are described and claimed for use for forge dies in forging and extrusion processes.

In the method of preparation, the aerogel readily breaks down to a particle size of 0.25 micron or less merely by simple mixing with the oil, which is claimed to be unexpected and not characteristic of aerogels prepared from silicate solutions containing more than 8% silicate concentrations. Amine "O" is obtainable from Alrose Chemical Co. This patent claims use of a nitrogen base cationic surface-active water-stabilizing agent.

News Items

For use where lubrication must be infrequent, Alpha Molykate Corp., Stamford, Conn., introduced Molykate-165X, a near-colloidal dispersion of molybdenum disulfide in a tacky and adhesive petroleum base. It is said to give a lubricating film effective at even 0° F. Chem. Wk. 7/16/55 p. 62.

U. S. Patent 2,712,402—Tecalemit Ltd.—Nozzles for grease guns and the like.

U. S. Patent 2,715,491—Our Savior's Evangelical Lutheran Church—Grease dispenser.

PEOPLE in the Industry

PAUL BOGNER

Emery Appoints Paul Bogner

Paul Bogner has been assigned to the Chicago District Sales Office of Emery Industries, Inc., it is announced by R. F. Brown, chemical sales manager.

The area, consisting of Minnesota, Wisconsin, the northern half of Iowa, northern Illinois and part of metropolitan Chicago, will be Mr. Bogner's direct sales responsibility. He will handle all Emery Chemical Products including fatty acids and derivatives, plasticizers and textile oils.

Prior to joining Emery Industries, Mr. Bogner was associated with the sales organizations of Inland Wire Company and Charles Pfizer & Company. He received his B. S. degree in chemistry from the University of Southern California in 1948.

E. J. Campbell to Supervise Research at Acheson

Erwin J. Campbell has recently been appointed Supervisor of Process Research, Research and Development Department, Acheson Colloids Company, Port Huron, Michigan. Mr. Campbell has been with Acheson since October, 1945, as Product Development Chemist in the same department.

Supervisor of Process Research is a newly defined position in the company, currently enlarging its laboratory and pilot plant facilities.

After receiving the degree of B.S.

E. J. CAMPBELL

in Chemical Engineering from the University of Michigan in January, 1943, 1st Lieut. Campbell served two and one-half years in the U. S. Army Corps of Engineers. His decorations include five battle stars earned in European combat.

Mr. Campbell is active in the local Industrial Management Club and in the Knights of Columbus in St. Clair. He resides in Port Huron with his wife, the former Gertrude M. Murphy, and their son.

Socony Mobil Appoints H. D. Gasarch

Appointment of Harry D. Gasarch as assistant comptroller of Socony Mobil Oil Company, Inc., has been announced at the company's headquarters in New York. He has been manager of Socony Mobil's comptroller's foreign department since 1953, spending nearly half of his time on assignments in Western Europe, West Africa and the Middle East.

Mr. Gasarch joined the company in 1929 as a junior clerk in domestic trade and, in 1951, became manager of accounting and statistics reviews. He was coordinator for the subcommittee of the API Financial and Accounting Committee, which wrote the Outline of Petroleum Industry Accounting.

Mr. Gasarch attended the New York University School of Commerce under Socony Mobil's educational refund plan; was elected to Arch and Square, N.Y.U's senior honorary society; and received his BCS degree in accounting in 1934. He passed the New York State CPA examinations in 1937.

Mr. Gasarch was born in New York City. He lives with his wife and a 14-year-old son, Mark A. Gasarch, on Genesee Trail, Harrison, N. Y.

Nopco Names Ackerman Advertising Manager

Edward G. Ackerman has been appointed Advertising Manager of the Nopco Chemical Company. The announcement was made by G. Daniel Davis, Executive Vice President of Nopco.

Mr. Ackerman has had more than fifteen years experience in various phases of advertising and sales promotion work. He is a former vice president of Riedl & Freede, Inc., an advertising agency. He has also been associated with the Hercules Powder Company, the Koppers Company, and the Manufacturers Chemical Company.

In his new position at Nopco, Mr. Ackerman will be in charge of advertising and sales promotion for the entire company. This includes Nopco's Industrial Division, which manufactures industrial chemicals for the leather, textile, paper, paint, cosmetic, and many other industries; its Vitex Division, which produces vitamin concentrates for milk and other dairy products; its Agricultural Department, producing nutritional supplements for animal feeds; and its newly expanded Plastics Division.

Nopco Appoints A. O. Brookes

Alfred O. Brookes has been appointed Assistant Secretary of the Nopco Chemical Company. The announcement was made by Ralph Wechsler, President of Nopco, following a recent meeting of the Board of Directors.

Coming to Nopco in 1926, Mr. Brookes worked as a clerk, and later, as a bookkeeper. His most recent position with the company has been that of Chief Accountant. He was educated at Kearny High, Kearny, N. J., and Pace College of New York City. He is a resident of Bloomfield, N. J.

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NLGI Associate and Technical Mem

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Central Can Company
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Representative—Henry Frazin

Continental Can Company, Inc.
629 First National Bank Bldg., Omaha, Neb.
Representative—T. A. Graham

Geuder, Paeschke & Frey Company
324 North Fifteenth St., Milwaukee 1, Wis.
Representative—Neil Savee

Inland Steel Container Company
6532 South Menard Ave., Chicago 38, Ill.
Representative—Robert J. Greenebaum

Jones & Laughlin Steel Corporation
Container Division
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Representative—D. O. Merrill

National Steel Container Corp.
6700 South LeClaire Ave., Chicago 38, Ill.
Representative—Henry Rudy

The Ohio Corrugating Company
917 Roanoke Ave. S. E., Warren, Ohio
Representative—Lawrence F. McKay

Republic Steel Corporation
Container Division
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Representative—Theodore Humphrey

Rheem Manufacturing Company
477 Madison Ave., New York 22, New York
Representative—F. J. Blume

Rieke Metal Products Corporation
Auburn, Indiana
Representative—Mahlon E. Rieke

Trilla Cooperage, Inc.
2524 Blue Island Ave., Chicago 8, Ill.
Representative—Lester Trilla

United States Steel Products
Division, United States Steel Company
30 Rockefeller Plaza, New York 20, N.Y.
Representative—Wm. I. Hanrahan

Vulcan Containers, Inc.
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Representative—H. B. Scharbach

MANUFACTURERS OF EQUIPMENT FOR APPLICATION OF LUBRICATING GREASES

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Representative—R. W. Morrison

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Disney near Marburg, Cincinnati 9, Ohio
Representative—Richard P. Field

Gray Company, Inc.
60 Northeast 11th Ave., Minneapolis 13, Minn.
Representative—B. A. Beaver

Lincoln Engineering Company
5701 Natural Bridge Ave., St. Louis 20, Mo.
Representative—G. A. Hubbard

Stewart-Warner Corporation
Alemite Division
1826 Diversey Parkway, Chicago 14, Illinois
Representative—D. C. Peterson

United States Air Compressor Co.
5300 Harvard Ave., Cleveland 5, Ohio
Representative—C. A. Bening

MARKETING ORGANIZATIONS

California Texas Oil Company, Ltd.
551 Fifth Ave., New York 17, New York
Representative—Hal U. Fisher

Canadian Petrofina Limited
1015 Beaver Hall Hill
Montreal, Quebec, Canada
Representative—M. E. Wight

REFINERS

Farmers Union Central Exch., Inc.
P. O. Box G, St. Paul 1, Minnesota
Representative—H. F. Wagner

D-X Sunray Oil Company
Mid-Continent Bldg., P.O. Box 381, Tulsa, Okla.
Representative—J. W. Basore

Valvoline Oil Company
Division of Ashland Oil & Refining Co. Box G
Freedom, Pennsylvania
Representative—D. A. Smith

SUPPLIERS OF EQUIPMENT FOR MANUFACTURING LUBRICATING GREASES

Barrett Manufacturing Company
P. O. Box 8096, Houston 4, Texas
Representative—George J. Barrett, Jr.

Blaw-Knox Company
Buflovak Equipment Division
1543 Fillmore Ave., Buffalo 11, New York
Representative—Edward V. Hegg

Chemicolloid Laboratories, Inc.
30 Church St., New York 7, New York
Representative—David F. O'keefe

The Girdler Company
A Div. of National Cylinder Gas Co. Box 987
Louisville 1, Kentucky
Representative—J. E. Slaughter, Jr.

Manton-Gaulin Mfg. Co., Inc.
44 Garden Street
Everett 49, Massachusetts
Representative—G. W. Eldridge

Morehouse Cowles, Inc.
707 Henry Grady Building, Atlanta 3, Georgia
Representative—George E. Missbach

The C. W. Nofsinger Company
906 Grand Ave., Kansas City 6, Missouri
Representative—C. W. Nofsinger

Stratford Engineering Corporation
612 W. 47th Street, Kansas City 12, Missouri
Representative—D. H. Putney

SUPPLIERS OF MATERIALS FOR MANUFACTURING LUBRICATING GREASES

Acme-Hardesty Company
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Representative—W. C. Hardesty

American Cyanamid Company
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New York 20, New York
Representative—R. B. Wainright

Archer-Daniels-Midland Company
Chemical Products Division, 2191 W. 110th St.
Cleveland 2, Ohio
Representative—Frank C. Haas

Armour & Co., Chemical Division
1355 West 31st St., Chicago 9, Illinois
Representative—H. F. Whitler

The Baker Castor Oil Company
120 Broadway, New York 5, New York
Representative—H. H. Fritts

Climax Molybdenum Company
500 Fifth Ave., New York 36, New York
Representative—Elwin E. Smith

Darling & Company
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Representative—G. W. Trainor

E. I. du Pont de Nemours & Co.
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The Elco Lubricant Corporation
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Representative—Frank X. Sieloff

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Representative—R. F. Brown

Enjay Company, Inc.
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Representative—Sidney W. Fay

Foote Mineral Company
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Representative—W. F. Luckenbach

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Chemical Division, 400 Second Ave. South
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Representative—Abner C. Hopkins, Jr.

A. Gross and Company
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Representative—Eugene W. Adams

Harchem Division
Wallace & Tiernan, Inc.
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N. I. Malmstrom & Company
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Metasap Chemical Corporation
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Minerals & Chemicals Corporation of America
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Representative—T. E. Shine

M. W. Parsons—Plymouth, Inc.
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Representative—Herbert Bye

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Representative—Garry B. Curtiss

Swift & Company
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Representative—C. F. Williams

Witco Chemical Company
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Representative—E. F. Wagner

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Institut Francais du Petrole
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Rueil—Malmaison (S. et Oise) France

Les Laboratoires de Recherches Purfina
31 rue de la Loi, Bruxelles, Belgium
Representative—R. Gillerot

Midwest Research Institute
425 Volker, Kansas City 10, Missouri
Representative—Dr. M. H. Thornton

Petroleum Educational Institute
9020 Melrose Avenue, Los Angeles 46, Calif.
Representative—G. A. Zamboni

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Representative—Mrs. G. A. Krawetz

Products Development Laboratory
1 Market St.
West Warwick, Rhode Island

Sociedad Nacional de Petroleos
Rua D. Pedro V, no. 80, Lisbon, Portugal
Representative—Manuel Corda Boullosa

Witco Appoints Dale Strasser

Appointment of Dale Strasser as Materials Handling Engineer for Witco Chemical Company was announced recently by Harry M. Brubaker, Witco Rubber Chemicals Vice-President.

In his new capacity in the Rubber Chemicals Dept. in Akron, Mr. Strasser is available to rubber, ink, and other industries for consultation of problems relating to carbon black packaging, storage and transportation. He was formerly on the staff of the Witco-associated Continental Carbon Company in Amarillo, Texas, where he was responsible for engineering details of carbon black packaging, unit loading and shipping as well as pilot plants and production.

Prior to joining Continental Carbon in 1950, Mr. Strasser was employed as pilot plant engineer of the Texas Company's laboratory at Montebello, California. He is a graduate of Iowa State College and is a registered professional engineer in California and Texas.

Mr. Strasser is a member of the American Society of Mechanical Engineers, American Institute of Chemical Engineers and the American Chemical Society.

U. S. Steel Appoints Ralph C. Moffitt

The appointment of Ralph C. Moffitt to assistant vice president and director of purchases of United States Steel Corporation was announced today by Carl A. Ilgenfritz, vice-president—purchases. With this appointment, Mr. Moffitt retains his present responsibilities and assumes those of R. L. Van Cleve, assistant vice president—purchases, who is retiring after 41 years with U. S. Steel.

Mr. Moffitt joined United States Steel in the purchasing department of the Columbia Steel Company in San Francisco immediately after graduation from the school of business administration at the University of California. In 1943, he was transferred to Provo, Utah, as purchasing agent—Utah operations. Two years later he came to Pittsburgh to handle the purchasing for Columbia Steel Company's expansion and reconversion program in the Far West. In 1947, he was appointed assistant vice president—purchases, of the United States Steel Corporation of Delaware.

Named director of purchases of United State Steel Company on January 1, 1951, two years later he became director of purchases of the United States Steel Corporation, his position at the time of the present appointment.

Mr. Moffitt is a director of the Purchasing Agents Association of Pittsburgh and chairman of the development committee on visual education of the National Association of Purchasing Agents.

During 1952, he served as a consultant to the citizens committee on Pennsylvania state government. He is a member of the American Iron and Steel Institute, the Association of Iron and Steel Engineers, Duquesne Club and Chartiers Country Club of Pittsburgh and University Club of Chicago.

Joseph W. Calby Joins Acheson Newark Office

Mr. Joseph W. Calby has joined the Newark office of Acheson Industries, Inc., as assistant to the Technical Director, Mr. Raymond Szymanowitz.

Following his graduation from Cornell University in June 1951, as a Bachelor of Chemical Engineering,

J. W. CALBY

J. E. CONNELL

Mr. Calby was employed until September 1953 by the Atlantic Refining Company, as an assistant chemical engineer in the Economic Evaluation Division. From December 1953 to September 1955, he was stationed at the Army Chemical Center, Maryland, as a group leader of piloting processes for the manufacture of toxic agents.

Mr. Calby attended Franklin and Marshall Academy in Lancaster, and the Mercersburg Academy in Mercersburg, Pennsylvania. He is married to the former Diana Heywood of Buffalo, New York, and lives at Beech Spring Drive, Summit, New Jersey. Mr. Calby is a member of the American Institute of Chemical Engineers.

Nopco Appoints New West Coast Sales Managers

Joseph E. Connell and Robert J. Kingsley have been named sales managers of new sales departments set up by the Pacific Division of the Nopco Chemical Company. The announcement was made by Perc S. Brown, Vice President of Nopco in charge of the Pacific Division.

The new sales departments are part of Nopco's West Coast expansion program. Previously, one sales manager was responsible for Nopco's sales. Under the new setup, each field will be handled independently, thus making possible an intensified sales effort.

Mr. Connell, as Sales Manager of industrial chemicals, will be in charge of sales of Nopco chemicals for the paper, textile, leather, and other industries, as well as the sales function for the Metasap Chemical Company, producer of stearates, a subsidiary of Nopco. Associated with Nopco since 1935, he recently served as industrial sales representative for the company in southern California.

Mr. Kingsley, as Sales Manager of vitamin products, will be responsible for the sales of Nopco vitamin products such as Vitex vitamin concentrates for milk and other dairy products, nutritional supplements for poultry and animal feeds, and pharmaceuticals. A former partner in Kingsley-Erb & Company, Nopco's vitamin sales representative in southern California, Mr. Kingsley was for many years a member of Nopco's sales force.

Previously based in southern California, both men will now make their headquarters in Richmond, Calif., Nopco's Pacific Division office.

Shell Oil Man Wins Chemical Society Award

Milburn J. O'Neal, Jr., group leader in Shell Oil Company's manufacturing-research laboratory in Houston, Texas, has been named winner of the $1,000 Precision Scientific Company award in petroleum chemistry. It was given O'Neal in recognition of his work in the application of mass spectrometry to hydrocarbon analysis in the high molecular weight range.

Mr. O'Neal will deliver an address on this subject before a session of the American Chemical Society Division of Petroleum Chemistry at the 1956 spring meeting of the society, to be held in Dallas, Texas, on April 8-13. The award will be presented at the meeting.

A paper, "Mass Spectrometric Analysis of High Molecular Weight, Saturated Hydrocarbons," co-authored by Mr. O'Neal, was presented at the Fourth World Petroleum Congress in Rome, Italy, last June.

Mr. O'Neal is a native of Franklin, Texas. He received his B.S. in chemistry from the University of Texas before joining Shell as a junior research chemist in Houston, in 1944. He was named senior research chemist in 1948 and named to his present position in 1951.

Emery Holds Chemical Sales Conference

Throughout the recent Emery Industries' Chemical Sales Conference the "Partners in Progress" theme pointed up Emery's efforts to develop new products and new uses as its contribution to the progress of the chemical industry.

Emery's salesmen, as propagators of this progress, received technical information on new products, new uses for old products and ways to increase customers' utilization of all Emery products. Tying-in with this were

Seated (L-R)—R. T. Hull, J. R. York, W. T. Meinert, W. C. Sowers, H. C. Armitage, A. R. McDermott, R. J. Roberts, J. E. Quinty, W. J. Siemens, J. D. Farr. Middle Row—A. C. Fusaro, P. M. Bogner, A. Moore, K. K. Boyd, J. P. Clancy, J. W. Ritz, J. A. Funk, R. F. Brown, O. W. B'Hymer, J. P. Kramer. Top Row—T. L. Reiling, E. W. Sack, R. A. Behrmann, C. T. Burgess, W. A. Colby, L. F. Church, R. D. Aylesworth, L. J. Hadobas, W. J. Major, N. A. Ruston, D. R. Eagleson, V. W. Colby.

presentations of new Emery diesters for synthetic lubricants, a new plasticizer for synthetic rubber and details on the use of Emery products in such new fields as polyurethanes, petroleum additives, polyesters, lubricating greases and many others.

Presentations by J. J. Emery, president, and A. W. Schubert, executive vice president, on future expansion plans further added to the "Partners in Progress" theme.

The four-day conference was con-

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DISPERSION AND WETTING OF SOLIDS		
4. Rubber Manufacture	Thermo Plasticizing Agent	Increases Dispersibility of Filler
5. Fuel Oil	Keeps Sludge in Suspension	Prevents Segregation of Moisture
6. Printing Ink Manufacture	Aids dispersion of pigment	Reduces Viscosity of Ink
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10. Emulsifiable Solvent Cleaners	Dispersing Agent for Oil and Grease Deposits	Acts as Emulsifying Agent
11. Dry Cleaning Compounds	Linking agent for Water and Solvent	Loosens Dirt Absorbed by Fabric
12. Fat Splitting Process	Dispersing Agent for Solid Fats	Acts as Wetting Agent
INHIBITION OF RUST AND CORROSION		
13. Corrosion Preventive Compounds	Rust and Corrosion Inhibiting Agent	Acts as Moisture Barrier
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cluded with a tour of the company's new production facilities and modern laboratories which house research, chemical engineering and experimental development activities.

Harold B. Stone Dies

Funeral services for Harold Barton Stone, of 806 Glen Road, Baederwood, a former Atlantic Refining Co. marketing executive, who died Sunday, October 2, were held at Oliver H. Bair's, 1820 Chestnut Street. Private burial was at Whitemarsh Memorial Park.

Mr. Stone, who was 65 was graduated from the University of Pennsylvania and Temple University Law School. He began a 43-year career with the company in 1912, became manager of the New York marketing region in 1934 and served as manager of the firm's lubricating sales from 1949 until retirement May 15.

A Mason, he was president last year of the Philadelphia Rotary Club. He also was president of the Temple University General Alumni Association and a member of the Philadelphia, Pennsylvania and American Bar Associations; the Union League and the Old York Road and Seaview Country Clubs.

He was an active member of Grace Presbyterian Church and before retirement served as a director of the National Lubricating Grease Institute, trustee of the National Petroleum Association and as a member of the American Petroleum Institute and the firm's Twenty-five Year Club.

He is survived by his wife, the former E. Beatrice Wallace; a son, Harold B., Jr., of Walla Walla, Wash., and two daughters, Mrs. L. Stewart Simon, of Huntingdon Valley, and Mrs. Carl A. Elmes, of Emmaus, Pa.

Chek-Chart Corp. Appoints T. H. Reed

Ray Shaw, President of The Chek-Chart Corporation, Chicago, announces the appointment of T. H. Reed as an account executive. The former Advertising Manager and Assistant to the President of Canfield Oil Company, Cleveland, Ohio, he will make his headquarters at Chek-Chart's Chicago office. With an extensive background in oil and rubber company merchandising, advertising, sales promotion and training, Reed will handle the sales of Chek-Chart's Canadian subsidiary, Chek-Chart Corporation Limited, in addition to servicing several U. S. oil and rubber company accounts.

NLGI Honorary Members

During the NLGI Annual Business Meeting on October 31st, the Active Members unanimously voted the establishment of an Honorary Membership group. Six past presidents who have since retired were the first to receive this honor since the inception of the organization in 1933.

Unanimously voted to receive this honor were:

Sydney Bevin
Milton R. Bower
Harold P. Hobart
Charles B. Karnes
Frank C. Kerns
Bertram Clark Voshell

One of NLGI Honorary Members Frank C. Kerns and four granddaughters. Left to right, Diana, Carol, F. C. Kerns, Barbara, and Cathy.

Bringing a close glimpse of an Honorary Member, here is one at home with four of his five granddaughters. He's Frank C. Kerns and it was way back on October 16, 1934 when he first served this industry as an NLGI Director. During his sixteen years as a Director he was a member of eleven various committees and Chairman of six. One of the early and long-forgotten committees was known as "Resolutions and Enlargement of Activities." This group did yeoman service in creating new activities designed to make the organization a greater benefit to members.

He became Vice-President in 1941 and President in 1942. He retired in 1950 with considerable first hand knowledge and experience in how to create an organization that continuously has served it's members and industry. The foundation he helped create has proven sound and lasting.

Desk and Derrick Club Elects New Officers

Edna Hurry of New York City was elected president of the Association of Desk and Derrick Clubs of North America for the 1956 term. Election of officers was held at the closing business session of the Fourth Annual Convention at the Hotel Commodore.

Continued on page 37

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Industry NEWS

Deep Rock Combines Northwest Sales Districts

A consolidation of sales districts, effective October 1, 1955, involving the states of North and South Dakota, Minnesota, and western Wisconsin was announced today by Vice-President, Marketing, J. G. Campbell, Deep Rock Oil Company. The Northwestern and North Central sales districts are now combined as the Minneapolis-Fargo District.

Coincident with this action three sales executive changes were affected. Elmer Wickum, former manager of Northwestern district will direct the sales activities of the Minneapolis-Fargo district with sales offices in both Minneapolis and Fargo.

B. A. Brokaw, former district sales manager of the North Central district in Minneapolis, returns to Tulsa to assume duties as district sales manager of the Tulsa district with headquarters in the Atlas Life building.

C. W. Dyniewicz, former district sales manager, southwest district, was appointed manager of the new service station sales department with headquarters in the Kerr-McGee building, Oklahoma City. Clyde E. Ragsdale, a former Deep Rock marketing employee, and who for the past several years has been engaged in petroleum product sales activities in Oklahoma, returns to Deep Rock as assistant to Dyniewicz in the new department.

Dyniewicz joined Deep Rock in 1934 as a service station agent and has held virtually every position vital to service station and bulk plant operation. A native of Chicago, Ill., he attended Loyola high school there and was graduated from the University of Notre Dame with A.B. degree in 1932.

A Deep Rock employee of long standing, Wickum joined Deep Rock in 1929 as a salesman. For the past four years he has directed Deep Rock's sales operations in western Minnesota, North and South Dakota. Before coming to Deep Rock, he attended business college at Fargo, N. D., and was later employed by the Independent Oil & Gas Co.

A native of South Dakota, Brokaw joined Deep Rock in 1951 as jobber operations specialist and was appointed Southwest district sales manager in 1954. He assumed his present position early in 1955.

Before joining Deep Rock, Brokaw was director of Minnesota's Department of Taxation petroleum division for 12 years. During that time he was in close contact with oil jobbers throughout the Middle West and was particularly noted for his expert knowledge of stock control.

DuPont Offers New Safety Against Industrial Fires

A better method of spot control of small fires fed by flammable liquids or gas, or caused by electrical short-circuits, is offered in a new push-button aerosol package that uses a dry powder as the fire-killing agent.

Eliminating the toxicity associated with carbon tetrachloride, which until now has been used in many of the aerosol extinguishers, the new product uses a specially treated bicarbonate of soda to put out Class B and C fires. It is three to five times as effective as carbon dioxide or foam, its manufacturer claims.

Packed in a non-reusable 12-ounce container with a specially-designed nozzle, the aerosol product is said to be capable of extinguishing a three-square-foot gasoline pan fire, a six- to 10-foot gasoline spill fire, or a five-squarefoot pan fire of kerosene or fuel oil. It also provides a quick knock-down on Class A fires, reducing the blaze to embers which can be extinguished with a minimum amount of water.

Besides offering a fast, easy-to-use aid against small spot fires in industrial applications, the product has special advantages in restaurant or hotel kitchens because of the non-toxic nature of the bicarbonate of soda. Food doused with the chemical needs only to be washed or brushed off to remain edible after the fire has been extinguished.

Powder residue left at the scene of the fire can be cleaned up quickly with a vacuum cleaner or a damp cloth, the manufacturer points out, and areas in which the fire extinguisher has been used present no dangers from lingering vapors or by-products produced by the fire-killing agent.

Du Pont "Freon" fluorinated hydrocarbon propellent—a nonflammable, nontoxic compound that acts as the cold-making agent in many types of refrigeration equipment—provides the dispensing pressure in the aerosol product.

Monsanto and Lion Merger Approved by Shareowners

The merger of Lion Oil Company into Monsanto Chemical Company, as agreed upon by the directors of both corporations on July 21, was approved by Monsanto shareowners and Lion shareowners at meetings held in El Dorado, Arkansas, September 23.

A joint announcement concerning the vote of both shareowner groups was made by Edgar M. Queeny, board chairman, and Charles Allen Thomas, president, of Monsanto; and by T. H. Barton, chairman, and T. M. Martin, president of Lion.

The merger will become effective on September 30. A two-thirds ma-

Continued on page 33

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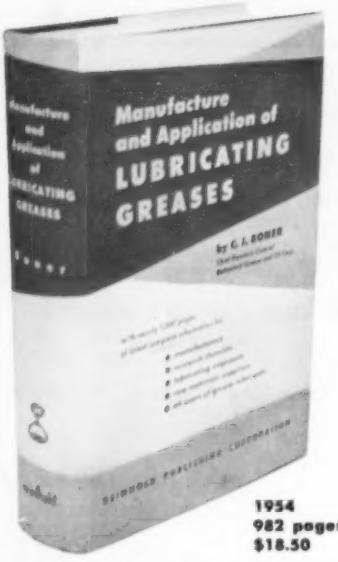

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13 Strontium Base Lubricating Greases
14 Miscellaneous Metal Soaps as Components of Lubricating Greases
15 Mixed Base Lubricating Greases
16 Complex Soap Lubricating Greases
17 Non-Soap Thickeners for Lubricating Fluids
18 Fillers in Lubricating Greases and Solid Lubricants
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Monsanto and Lion Merger

Continued from page 31

jority of the outstanding shares of both companies was required to approve the merger.

Basis of the merger is the exchange of 1½ shares of Monsanto $2 par value common stock for each outstanding share of Lion stock.

Martin and Barton have become members of the Monsanto board.

Lion Oil Company will be a division of Monsanto. Martin is to serve as president of the Lion division and, in addition, he has been elected a vice president of Monsanto by the Monsanto board. Jeff Davis of El Dorado, vice president and general counsel of Lion, has been elected as assistant secretary of Monsanto and E. W. Atkinson of El Dorado, vice president and treasurer of Lion, has been elected an assistant treasurer of Monsanto.

The officials of both companies expressed gratification for the excellent response by the shareowners of both organizations.

Socony Mobil Research Constructs New Building

Construction is expected to begin shortly on a $600,000 building to house the chemical, radio-chemical, physical, and other analytical operations of the Research and Development Laboratories of Socony Mobil Oil Company, Inc., at Paulsboro, N. J.

The new Analytical Laboratory, a major addition to the company's research facilities at Paulsboro, will nearly double the space available for analytical operations in petroleum research and will make possible the installation of the newest types of analytical equipment, according to William M. Holaday, director of Socony Mobil's Research Laboratories.

A construction permit has been awarded for the new building on the basis of plans prepared for Socony Mobil by the Ballinger Company, Philadelphia, the architects. General contractor will be Baton Construction Corp., also of Philadelphia.

The new building will be two stories high, of modern fireproof construction, with red brick and stone trim harmonizing with other research buildings at Paulsboro. It will contain about 45,000 gross feet of floor space. Over-all dimensions will be 183 feet by 73 feet.

The building will be air conditioned. A special air-conditioning system, designed in accordance with recommendations of the U. S. Atomic Energy Commission, will be installed in the building's radiochemical laboratory.

Four miles of plumbing, and enough wiring for a modern housing development of 150 units, will be installed in the building. Plans call for seven kinds of electrical current.

Laboratory work tables will be served by a complex of utilities, including not only hot, cold, and ice water, but distilled water, Mobilthane gas, compressed air, vacuum, steam, and carbon dioxide. In addition, hydrogen, oxygen, and nitrogen will be piped to some bench areas from a central cylinder room.

Primary job of the Analytical Laboratory, a service activity, is to perform routine testing for technical sections of the Paulsboro laboratories. With a staff of about 80 people, it performs upwards of 230,000 separate tests a year. In addition, it conducts research in new analytical techniques.

The main portion of the analytical staff is presently housed in a 30-year-old building, which will be renovated for use by other sections of the laboratories.

New Chemical Plant Dedicated by Shell

A multi-million-dollar chemical plant, first unit in a much larger chemical manufacturing facility, was dedicated recently by Shell Chemical Corporation in Norco, Louisiana.

The plant makes allyl chloride and chlorohydrins. These are used in making glycerine, one of the most widely-used industrial chemicals, and Epon resins for paints and other surface coatings.

The next unit to be built will make hydrogen peroxide. Construction on this will begin soon.

New Shell Terminal to Open In Niles, Michigan

A new terminal in Shell Oil Company's Detroit marketing division is scheduled to go into operation late this year at Niles, Michigan. This will add to the company's facilities on the Wolverine Pipe Line which serves a growing petroleum products market in the Great Lakes area.

The Niles terminal will have four major storage tanks and a total ca-

pacity of 137,000 barrels, a building for offices and utilities, a four-spot truck loading rack, and tank-car loading facilities.

Shell, Cities Service Oil Company and the Texas Company formed the Wolverine Pipe Line Company to build the 16-inch common carrier pipe line which began delivering products late in 1953. Shell designed the line, supervised its construction and is operating it under an agency agreement.

The line runs 295 miles from Hammond, Indiana, to Detroit, Michigan, and Toledo, Ohio. It is ultimately capable of delivering a total of about 160,000 barrels of petroleum products a day to terminals at Niles, Jackson and Detroit in Michigan, and Toledo.

Underwriters' Laboratories Approve Fielden Instruments

Two models of the "Tektor" capacity level control, manufactured by Fielden Instrument Division, Robertshaw-Fulton Controls Company, have been approved for listing by Underwriters' Laboratories, according to a company announcement.

The two instruments have been examined and will be listed in the new issue of the Underwriters' Laboratories Electrical Equipment list.

The company said the listing will cover Tektor models 1010-E and 1020-E, which have conformed to requirements for installation in hazardous locations, Class I, Groups C and D; and Class II, Groups E, F, and G.

Underwriters' Laboratories listings will also cover types of armored connecting cables and electrodes used in conjunction with the level control instruments.

Rocky Mountain Division Set Up by Shell Pipe Line Corp.

Shell Pipe Line Corporation will establish a new operating division with headquarters at Casper, Wyoming, it was announced today. Designated the Rocky Mountain Division, the new office opened officially on October 1.

The division will operate facilities of the Butte Pipe Line Company now under construction in Eastern Montana and Wyoming and Shell Pipe Line's wholly-owned facilities in northeastern Colorado. The Butte line, owned jointly by Shell Oil Company, Murphy Corporation, Placid Oil Com-

pany, and Northwestern Improvement Company (a subsidiary of Northern Pacific Railroad), will extend from Poplar, Montana, to Fort Laramie and Guernsey, Wyoming.

J. E. Mims, who has been superintendent of Shell Pipe Line's Rancho division with headquarters at Austin, Texas, has been named manager of the new division.

Mr. Mims, a graduate of Rice Institute, joined Shell in 1942 as a draftsman. He became an engineer in 1946 and later served as superintendent of the firm's Ozark division at Springfield, Missouri, before being made Rancho superintendent in Austin in 1952.

Socony Mobil's Nickerson Discusses Increasing Oil Demand

Barring a reversal of present trends in petroleum production and consumption, United States producers are going to find it "increasingly difficult" to keep up with demand over the next ten to twenty years, stated Albert L. Nickerson, president of Socony Mobil Oil Company.

Speaking before the Texas Mid-Continent Oil and Gas Association on "Future World Demand for Oil," Mr. Nickerson said that while it is always difficult to read future needs with accuracy ". . . as we see it at this moment the next ten to twenty years are likely to be years of steadily increasing demand."

Noting that consumption of liquid hydrocarbons in this country last year amounted to about 7,750,000 barrels a day, he predicted that this year's figure would be 8,300,000 barrels—an increase of more than 7 per cent.

By 1960, he estimated, the figure would rise to 9,700,000 barrels; in 1965 to 10,700,000; and in 1975 to 12,250,000.

This demand forecast, he said, indicates that "ten years from now, with nuclear energy still a fledging commercially, we shall need in the United States three million more barrels daily of liquid hydrocarbons than we did last year. Twenty years from now, when nuclear energy is expected to be a more important contributor to the total energy supply, our economists estimate that nearly four and a half million barrels daily more than last year will be required. This increase alone is well over half of last year's consumption."

Adding up the demand expected for the ten-year period, 1956-1965, alone, he said: "The total comes to nearly 36 billion barrels. This figure corresponds almost exactly to this country's present proved reserves."

Even though it is misleading to say that "we're running out of oil," he said . . . "we all know that it's getting harder and more expensive to build up our reserves. This is true not only because oil is becoming harder to find but because our need for it is increasing so rapidly."

This situation exists, he said, in spite of a drilling program since the end of World War II which has been the biggest in the industry's history and in spite of the fact that over the five-year period, 1950-1954, the industry has "proved" reserves at a rate averaging 3,760,000,000 barrels each year.

Even the 2,000,000-barrels-a-day reserve producing capacity which has been built up by the high drilling rate should not be misunderstood, he said, since it "probably does not accurately measure our ability to produce for any period longer than a few months." He noted that the annual rate of production in the U. S. has never significantly exceeded eight per cent of reserves even at maximum efficient rates of production, and continued:

"Last year the industry produced 2,560,000,000 barrels of oil and natural gas liquids in the United States. Eight per cent of our reserves would be 2,780,000,000 barrels. The difference between these two figures is 220,000,000 barrels, or 600,000 barrels a day. This may represent the country's approximate reserve producing capacity at MER over any sustained period and may be a more realistic figure of a dependable reserve productivity than the 2,000,000 barrel figure so often referred to."

Assuming petroleum is imported for the next ten years at the rates recommended by the Cabinet committee appointed by President Eisenhower and that production continues at the average rate of 8 per cent of proved reserves, he said, "we would then need to prove an average of 4,100,000,000 barrels a year over the decade in order to meet domestic demands forecast for those years."

While there are many imponderables ahead, he said, and conditions may differ substantially from what is now expected: "These may well be the approximate dimensions of the job ahead for our industry in this country . . . If the industry continues to be confronted with economic conditions similar to those we have with us today, its justly earned reputation for ingenuity, continued technological advancement, and tireless hard work will be put to still further tests to provide adequate petroleum supplies for all expected requirements."

Nopco Schedules Management Forums

Eight forum meetings dealing with production, personnel relations, plant safety, and other problems relating to management have been planned during the coming months by the Nopco Chemical Company. Nopco supervisory employees, from foremen to

top executives, have been invited to attend the dinner meetings, to be held at the Military Park Hotel in Newark, N. J.

The series commenced on October 18th with a speech by Nopco's president, Ralph Wechsler. Mr. Wechsler spoke on Nopco's plans for future expansion.

Subsequent meetings will deal with such topics as "Safety in Chemical Plants," "Improving Human Relations in Industry," "Nopco's Role in Textiles," "Glass in the Chemical Industry," "Translating Top Policy to the Foreman's Level," and "Nopco's Role in Paper Production." Speakers from the company will alternate with outside speakers at the meetings. Speakers already engaged are A. Lateiner, Professor of Personnel Relations at City College of New York, and B. G. Staples, who is in charge of courses in the handling and use of glass-lined equipment for the Pfaudler Company of Rochester, N. Y.

This is the second year Nopco has held such meetings. According to Harry A. Batley, Assistant Vice President, who originated the idea of a forum, and Richard C. Richter, who plans and arranges the meetings, company personnel attending last year's sessions responded so enthusiastically that a series was planned for this year.

Shell Offers Fellowship to Science Teachers

To help offset the dangerous cutback in science teaching at the secondary level—a basic cause for our critical shortage of graduate scientists—Shell Companies Foundation, Inc. today announced a broad program of recognition fellowships for high school teachers of science and mathematics.

Through the program, worked out with the cooperation of the leading educational associations, Shell will underwrite summer seminars at Stanford and Cornell Universities for 60 teachers yearly. The Fellowship recipients, chosen on the basis of merit and demonstrated leadership qualities, will receive travel allowances, all tuition and fees, living expenses on the university campus and $500 in cash to make up for the loss of potential summer earnings.

Basically, according to M. E. Spaght, Foundation president and executive vice president of Shell Oil Company, the program seeks to inspire those science teachers who, in turn, can best inspire the scientists and science teachers of tomorrow.

Mr. Spaght explained that the program, to be known as the Shell Merit Fellowships for High School Science and Mathematics Teachers, was developed following studies that showed a rapid decline in the number of college graduates entering the field of science teaching.

Last year, according to surveys, American colleges turned out 57 per cent fewer high school science teachers and 51 per cent fewer mathematics teachers than in 1950. Because of this acute science teacher shortage, Mr. Spaght added, more than half the high schools in the country now have *no* classes in physics or chemistry.

Since 1900, the percentage of students studying algebra in the high schools has fallen from 56 per cent to 24 per cent; geometry students have dropped from 27 per cent to 11 per cent. Today, only 4.3 per cent study physics—as against 19 per cent some 55 years ago.

Mr. Spaght said there is no lack of young people with the intelligence to master college courses in science and mathematics, but not enough seem willing to make the effort. Shell hopes to stimulate greater interest in the neglected fields. "We hope the Merit Fellowships will assist in focusing public attention on this critical shortage of science teachers and also induce others to do something similar," he added.

Stanford and Cornell were selected by Shell because of their outstanding science and education departments and their active role in trying to remedy the acute shortage of high school science and mathematics teachers.

Broader than any previous program advanced for science teachers, the Fellowships are particularly designed for the able, experienced teachers who ordinarily might seek remunerative summer employment outside the school system. The intensive seminar programs will include graduate-level classes, lectures by outstanding scientists and visits to modern industrial installations and research laboratories.

Mathematics, physics or chemistry teachers with five years' experience and known leadership ability will be eligible for the Fellowships. Thirty teachers from west of the Mississippi River will attend the eight-week Stanford program which will be administered by the School of Education. Thirty from east of the Mississippi will be invited to a similar six-week series of courses at Cornell.

In addition to teachers, also eligible are present heads of departments or supervisors with good background in mathematics, chemistry or physics who previously were teachers. Mr. Spaght explained that Shell is seeking to spread the recognition program as widely as possible among the nation's secondary schools. Final selection of the sixty will be the full responsibility of Stanford and Cornell.

In developing the plan, Shell consulted representatives of the American Association for the Advancement of Science, the National Association of Secondary School Principals, the National Science Teachers Association, the National Research Council, the

Joint Council on Economic Education and the National Council of Teachers of Mathematics.

The Fellowships are in addition to the Shell Companies Foundation's present $350,000 aid-to-education program which includes 50 graduate fellowships and 20 grants in fundamental research in science and engineering at 41 colleges and universities.

Desk and Derrick Officers

Continued from page 28

Miss Hurry, who is with the Standard Oil Company (N. J.) as office manager of their public relations department, is serving the Association as first vice president this year. She will succeed Mrs. Sybil Sureck of Oklahoma City as president.

Other officers elected from a double slate were: Lydia Babka of San Francisco, Honolulu Oil Corp., first vice president; Irma Cline of Wichita Falls, Texas, Nelson, Montgomery, Robertson and Sellers, second vice president; Elizabeth Van Kuyk of New York City, Socony Mobil Oil Co., secretary; and Esther Welch of Amarillo, Texas, Natural Gas Co., treasurer.

New regional directors are: Edith Snizek, auto tour service–Rand McNally & Co., New York City, Region I: Harriett Gregath, Tide Water Associated Oil Co., Kansas City, Region II; Ellen Vaughan, Carter Oil Co., Shreveport, La., Region III; Margaret Sevier, Taylor Oil and Gas Co., Corpus Christi, Texas, Region IV; LaVerne Montgomery, Rocket Petroleum Co., Lubbock, Texas, Region V; Anita Lang, Phillips Petroleum Co., Ardmore, Okla., Region VI; Edda Eldredge, Utah Southern Oil Co., Salt Lake City, Region VII; and Zetta Belle Housley, Shell Chemical Co., Long Beach, Calif., Region VIII.

Delegates from member clubs voted to hold the 1956 convention on September 7 and 8 in New Orleans. Attending the New York City convention were about 900 women employed in the petroleum industry from 90 of the 105 Desk and Derrick Clubs in the United States and Canada. ADDC has about 9,000 members.

The two-day convention closed with a banquet at which Robert B. Anderson, who served until recently in the Eisenhower Administration as Deputy Secretary of Defense, was the principal speaker.

David A. Shepard spoke on "Extending Horizons for Oil Industry Women" at the Saturday luncheon.

Mrs. Helen Valentine, editor-in-chief of CHARM Magazine, was the Friday luncheon speaker on the topic, Pioneer Woman–1955." CHARM coordinated a fashion show for this luncheon in which seven New York City stores participated.

Robert B. Anderson Addresses Desk and Derrick Members

The women in the oil industry are the "jeweled bearings" on which the entire business turns, and it is their ability to keep things running smoothly that in a large part accounts for the industry's success, former Deputy Secretary of Defense Robert B. Anderson told nine hundred oil women convened in New York for the fourth annual Desk and Derrick Club convention.

Mr. Anderson said that because executives are able to count on efficient help from women, they are free to devote their time to the really tough problems they are being paid to handle. "It is the cross that many an efficient worker must bear that her boss takes her for granted. Yet in his poor, ham-handed way, he is paying her about the highest compliment of which he is capable. Ten dozen roses in February couldn't represent his trust and confidence in her any more effectively," Mr. Anderson said.

Mr. Anderson also outlined briefly the amazing growth of the oil industry, and described the vital position it occupies today in our economy. He praised the free, competitive spirit that has enabled the United States to become the greatest oil producing nation in the world.

Because America is the bastion of freedom, we have a special responsibility to the world, he said. Every woman in the oil industry can feel she is contributing to the great goals of freedom and opportunity for all, Anderson concluded. "To you women belongs the satisfaction of knowing that in doing your job well, you are not only contributing to the success of your company, but you are also serving your country in a very special way."

Desk and Derrick Awards

First place in the Best All-Around Bulletin Division of the 1955 Member Club Bulletin Contest conducted by the Association of Desk and Derrick Clubs of North America, was awarded to Lise Tescher, Editor of *Swivel Squeaks*, Denver, Colorado, at the convention of the Association in New York. Miss Tescher is affiliated with Calvert Drilling, Inc., Denver.

First place in the Best Writing Division was awarded to Regina Glasco, Sun Oil Company, Toledo, Ohio, for an article entitled "Magic in Crude Clothing" published in *Drills and Frills* of the Toledo Club.

In the Best Art or Drawing Division first place went to Thelma Brockman, now with Richfield Oil Corporation, Long Beach, California, for the cover of *Desk and Derrick Diggin's* published by the Shreveport Desk and Derrick Club.

Those receiving honorable mention in the Best All-Around Bulletin Division were: Helen Jones (Esso Standard Oil Company), Editor of *Bayou Gusher*, Baton Rouge; Bernice Paris (Halliburton Oil Well Cementing Company), Editor of *Black Magic*, Duncan, Oklahoma; and Margaret Frisken (McColl-Frontenac Oil Co. Ltd.), Editor of *Black Gold*, Calgary, Alberta, Canada.

Honorable Mention in the Best Writing Division was awarded to: Stella D. Condry (Plymouth Oil Company) for her article "Poor Kelly" which was published in *Drake's Daughters*, Pittsburgh; and tied for third place were Anita Lang (Phillips Petroleum Company), for "Something New Under the Sun" published in *The Producer*, Ardmore, Oklahoma, and Bernice Paris (Halliburton) for "Oil Industry Services Represented at D. and D." published in *Black Magic*, Duncan, Oklahoma.

In the Best Drawing Division, honorable mention was received by: Loretta Todd (Carter Oil Company) for the cover of *Derrick Lights*, Oklahoma City; Bobbe Jean Shehorne (Halliburton Oil Well Cementing Company) for the cover of *Black Magic*, Duncan, Oklahoma; and Margaret Wright (United States Bureau of Mines) for the cover of *Oil Gal's Gazette*, Bartlesville, Oklahoma.

FUTURE MEETINGS of the Industry

NOVEMBER, 1955

9-10 Society of Automotive Engineers (fuels and lubricants meeting), Bellevue-Stratford Hotel, Philadelphia, Pa.

13-18 American Society of Mechanical Engineers (75th anniversary meeting), Hilton & Blackstone Hotels, Chicago, Ill.

14-16 American Petroleum Credit Association, Carter Hotel, Cleveland, Ohio.

14-17 American Petroleum Institute (35th annual meeting), Mark Hopkins, Fairmont, St. Francis, and Palace Hotels, San Francisco, Calif.

14-18 Chicago Exposition of Power and Mechanical Engineering (ASME), Coliseum, Chicago, Ill.

16 American Petroleum Institute (OIIC Steering Committee meeting), San Francisco, Calif.

17 National Industrial Conference Board (general session), Bellevue-Stratford Hotel, Philadelphia, Pa.

18-22 National Safety Council and National Safety Congress and Exposition, Chicago, Ill.

20-21 Western Petroleum Refiners Association (regional technical and industrial relations meeting), Garrett Hotel, El Dorado, Ark.

27-30 American Institute of Chemical Engineers (annual meeting), Statler Hotel, Detroit, Mich.

30 Mid-Continent Oil & Gas Association (annual meeting, Board of Directors), Tulsa Club, Tulsa, Okla.

DECEMBER, 1955

1-3 American Chemical Society (Southwest meeting), Shamrock Hotel, Houston, Tex.

1-3 Interstate Oil Compact Commission, La Fonda Hotel, Santa Fe, N. M.

5-9 25th Exposition of Chemical Industries, Commercial Museum and Convention Hall, Philadelphia, Pa.

6-7 Petroleum Packaging Committee of Packaging Institute, Benjamin Franklin Hotel, Philadelphia, Pa.

8-9 American Petroleum Institute (OIIC meeting), Waldorf-Astoria Hotel, New York, N. Y.

11-14 American Society of Agricultural Engineers (Winter meeting), Edgewater Beach Hotel, Chicago, Ill.

JANUARY, 1956

9-13 SAE Annual Meeting, Sheraton-Cadillac Hotel and Hotel Statler, Detroit, Mich.

10-12 Kentucky Petroleum Marketers Assn. (30th annual meeting), Brown Hotel, Louisville, Ky.

25-26 Northwest Petroleum Association (annual convention), Nicollette Hotel, Minneapolis, Minn.

30 to
Feb. 3 American Institute of Electrical Engrs. (1956 Winter general), Statler Hotel, New York, N. Y.

FEBRUARY, 1956

22-23 Iowa Independent Oil Jobbers Association, Inc. (convention), Fort Des Moines Hotel, Des Moines, Ia.

MARCH, 1956

7-9 American Petroleum Institute (Division of Production, Southern District Meeting), Plaza Hotel, San Antonio, Tex.

12-16 National Assn. of Corrosion Engrs. (annual convention), Statler Hotel, New York, N.Y.

19-21 Western Petroleum Refiners Association (annual meeting), Plaza Hotel, San Antonio, Tex.

20-22 Ohio Petroleum Marketers Assn., Inc. (Spring Convention & Trade Exposition), Deshler-Hilton, Columbus, Ohio.

21-23 American Petroleum Institute (Division of Production, Southwestern District Meeting), Texas Hotel, Fort Worth, Tex.

APRIL, 1956

2-4 American Institute of Electrical Engrs. (Southwest District No. 7), Dallas, Texas.

16-20 Greater New York Safety Council (annual convention and exposition), Statler Hotel, New York, N. Y.

18-20 National Petroleum Association, Cleveland, Ohio

22-26 National Tank Truck Carriers, Inc., Shoreham Hotel, Washington, D. C.

30 to
May 1 Independent Petroleum Association of America (semiannual meeting), Statler Hotel, Los Angeles, Cal.

30 to
May 2 Chamber of Commerce of the United States (annual meeting), Washington, D. C.

30 to
May 4 American Petroleum Institute (safety and fire protection mid-year meeting), Warwick Hotel, Philadelphia, Pa.

JUNE, 1956

3-8 SAE Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

17-22 ASTM 59th Annual Meeting and 12th Apparatus Exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J.

SEPTEMBER, 1956

7-8 Desk & Derrick Club, New Orleans, La.

12-14 National Petroleum Association, Atlantic City, N. J.

16-22 ASTM 2nd Pacific Area National Meeting and Apparatus Exhibit, Hotel Statler, Los Angeles, Calif.

OCTOBER, 1956

29-31 NLGI ANNUAL MEETING Edgewater Beach Hotel, Chicago, Ill.

NOVEMBER, 1956

1-2 SAE National Diesel Engine Meeting, Drake Hotel, Chicago, Ill.

8-9 SAE National Fuels and Lubricants Meeting, The Mayo, Tulsa, Okla.

APRIL, 1957

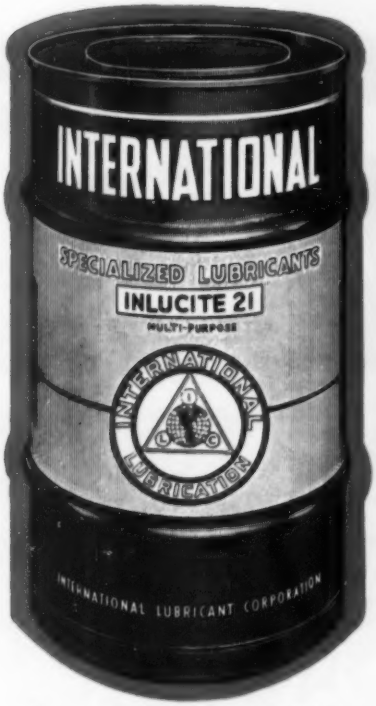
16-18 National Petroleum Association, Cleveland, Ohio

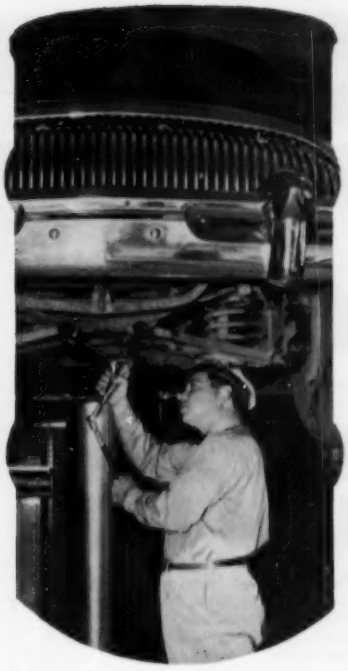
JUNE, 1957

16-21 American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J.

SEPTEMBER, 1957

11-13 National Petroleum Association, Atlantic City, N. J.





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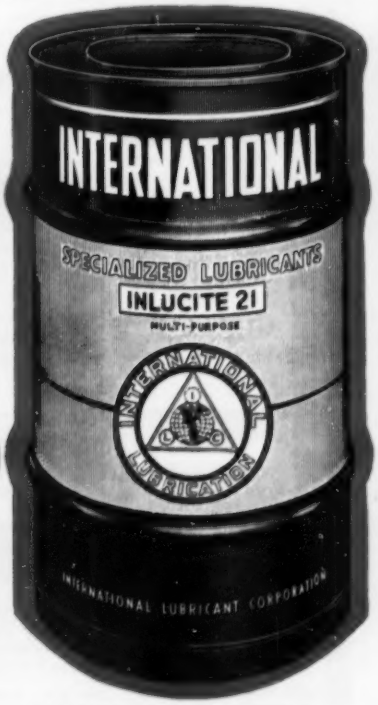

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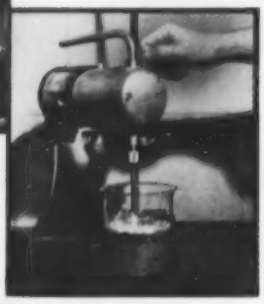

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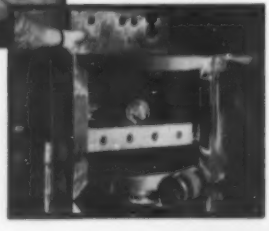

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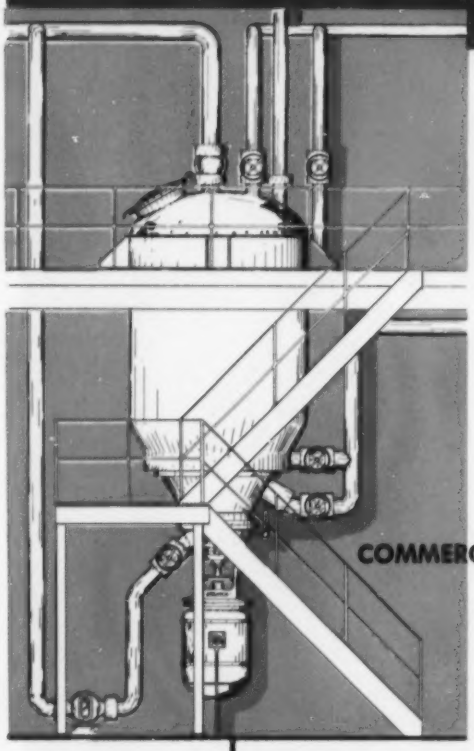

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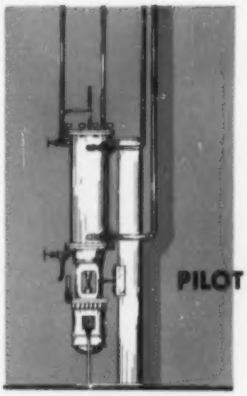

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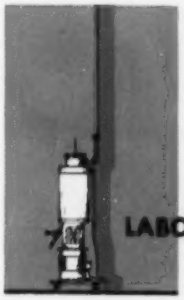

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